UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,673	07/04/2003	Chin-Long Lin	68146241-005009	7325

23562 7590 01/12/2007 BAKER & MCKENZIE LLP PATENT DEPARTMENT 2001 ROSS AVENUE SUITE 2300 DALLAS, TX 75201	**EXAMINER** REKSTAD, ERICK J

ART UNIT	PAPER NUMBER
2621	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/12/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

	Application No.	Applicant(s)
Office Action Summary	10/614,673	LIN ET AL.
	Examiner	Art Unit	
	Erick Rekstad	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>07 April 2003</u>.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

This is a First Office Action for application no. 10/614,673 filed on July 4, 2003

wherein claims 1-38 are presented for examination.

Claim Objections

Claim 6 is objected to because of the following informalities: The claim states

"macroblocksresulting" on line 24 of page 19. The claims should state "macroblocks

resulting". Appropriate correction is required.

Claim 8 is objected to because of the following informalities: The claim states "of

in step (b6)" on line 29 of page 20. The claim should state "in step (b6)." Appropriate

correction is required.

Claims 18 and 20 are objected to because of the following informalities: The

claims depend on the wrong claims. It is assumed by the examiner that claim 18 should

depend on claim 17 and claim 20 should depend on claim 19.

Specification

The abstract of the disclosure is objected to because the abstract should be

corrected to remove "the invention advantageously provides" and start the abstract with

"A method". Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly
claiming the subject matter which the applicant regards as his invention.

Claims 1, 8 and 35 are rejected under 35 U.S.C. 112, second paragraph, as

being indefinite for failing to particularly point out and distinctly claim the subject matter

which applicant regards as the invention.

[claim 1]

The claim states in step (a1) the "dividing a plurality of reference macroblocks".

This statement is unclear and, as best understood by the examiner, should be amended

to state "dividing the reference frame into a plurality of reference macroblocks each

comprising...". A similar clearly issue arises with the step of (a2). The "dividing at least

one current macroblock" should be amended to state "dividing the current frame into at

least one current macroblock comprising...".

[claim 8]

The method steps of (b1) and (b2) contain identical errors to those indicated

above for claim 1. The Examiner suggest the Applicant amend the claims to clarify the

origin of the macroblocks.

[claim 35]

The claim states the first pixel is equal to: (said adjacent sum+said adjacent

difference)/2. Based on the requirement of "subtracting said first pixel from said second

pixel resulting in an adjacent difference", the second pixel would equal (said adjacent

sum+said adjacent difference)/2. The Applicant's specification states the variable

DIFF=P1-P2 (Page 9 Lines 10-16). But the claim requires DIFF=P2-P1. This

discrepancy also appears on Page 11 Lines 9-13 of the specification, where the

Applicant again requires DIFF=P2-P1.

The claim further teaches the steps to obtain the first and second pixel values

from the first and second pixel values. Therefore, there is no restoring of the pixel

values because they appear to already exist.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, and 8-12 are rejected under 35 U.S.C. 102(b) as being anticipated by

US Patent 5,576,772 to Kondo.

[claim 1]

Kondo teaches a motion estimation method for estimating a motion vector

between a reference image frame and a current image frame, each of said reference

frame and said current frame being formed by a plurality of pixels (Abstract, Figs. 10a-

e), the method comprising the steps of:

(a1) dividing a plurality of reference macroblocks each comprising a plurality of

adjacent pixels within said reference frame, a set of said reference macroblocks forming

a search range (Col 9 Line 58-63, Fog. 10a).

(a2) dividing at least one current macroblock comprising a plurality of continuous

pixels from said current frame, each of said reference macroblocks and said at least

one current macroblock having generally the same size and shape with corresponding

pixel distribution (Col 1 Lines 5-19, Col 2 Lines 10-14 and Lines 34-40, Figs. 2A and 4).

Note: Kondo's invention relates to an optimization of the motion vector detection in

MPEG compression, therefore it would be inherent that Kondo's invention divides the

frames into macroblocks as suggested by the citation above.

(a3) determining a similarity of one of said reference macroblocks and a selected

one of said at least one current macroblock based on averages of every two adjacent

pixels as a pixel unit in said selected current macroblock and said reference

macroblocks (Col 6 Line 64-Col 7 Line 42, Col 8 Lines 23-26, Figs 6B and 9B). It is

noted by the Examiner that the claim does not require the pixel units to be only based

on two horizontally adjacent pixels therefore Kondo's teaching of a 2x2 block of pixels is

viewed by the Examiner to satisfy the requirements of the claim.

(a4) repeating step (a3) for all of said reference macroblocks in said search

range (Col 10 Lines 9-40, Fig. 10B);

(a5) determining a motion estimation of said current frame and said reference

frame based on said respectively determined similarity in steps (a3) and (a4) (Col 10

Lines 41-67, Fig. 10C).

[claims 2, 3, 9 and 10]

Kondo further teaches the calculating an absolute difference of a pixel unit for

every two adjacent pixels in said current macroblock and a corresponding pixel unit for

every two adjacent pixels in said reference macroblocks resulting in a plurality of

calculated absolute differences; and

Summing said calculated absolute differences for all of said pixel units of said

current macroblock (Col 9 Lines 16-33 and Lines 45-49)

Kondo teaches the determining a motion estimation vector between said selected

current macroblock and one of said reference macroblocks within said search range

having a smallest sum of said calculated absolute differences with said current

macroblock (Col 2 Lines 43-51, Col 9 Lines 28-49, Col 10 Lines 19-28, Fig. 10D).

[claim 8]

As shown above form claim 1, Kondo teaches the requirements of steps (b1)-

(b3). Kondo further teaches:

(b4) determining similarities for said first predetermined set of reference

macroblocks in said search range for performing a coarse tune operation;

(b5) determining a preferred reference macroblock from said first predetermined

reference macroblocks based on said similarities;

(b6) determining similarities for a second predetermined set of reference

macroblocks around said preferred reference macroblock based on pixels of said

current macroblock and said second predetermined set of reference macroblocks for

performing a fine tune operation; and

(b7) determining a motion estimation of said current frame and said reference

frame from said determined similarities in step (b6) (Col 6 Line 64-Col 7 Line 10, Col 10

Lines 9-67, Figs. 10B and 10C).

[claims 11-12]

Kondo teaches the use of absolute difference of pixels between the current

macroblock and a reference macroblock (Col 2 Lines 43-51 and Col 9 Lines 50-55).

Claims 1-3, 8-10, 21-26, 34, and 36-38 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 6,011,870 to Jeng et al.

[claims 1, 8, and 34

Jeng teaches a motion estimation method for estimating a motion vector between a reference image frame and a current image frame, each of said reference frame and said current frame being formed by a plurality of pixels (Abstract), the method comprising the steps of:

(a1 and b1) dividing a plurality of reference macroblocks each comprising a plurality of adjacent pixels within said reference frame, a set of said reference macroblocks forming a search range (Col 10 Line 62-Col 11 Line 4).

(a2 and b2) dividing at least one current macroblock comprising a plurality of continuous pixels from said current frame, each of said reference macroblocks and said at least one current macroblock having generally the same size and shape with corresponding pixel distribution (Col 2 Lines 8-24, Col 10 Line 62-Col 11 Line 4). Note: Kondo's invention relates to an optimization of the motion vector detection in MPEG compression, therefore it would be inherent that Kondo's invention divides the frames into macroblocks as suggested by the citation above.

(a3 and b3) determining a similarity of one of said reference macroblocks and a selected one of said at least one current macroblock based on averages of every two adjacent pixels as a pixel unit in said selected current macroblock and said reference macroblocks (Col 3 Lines 39-43, Col 8 Lines 12-26, Fig. 11a).

(a4) repeating step (a3) for all of said reference macroblocks in said search range (Col 5 Line 52-Col 6 Line 2);

(b4) determining similarities for said first predetermined set of reference macroblocks in said search range for performing a coarse tune operation;

(b5) determining a preferred reference macroblock from said first predetermined reference macroblocks based on said similarities;

(b6) determining similarities for a second predetermined set of reference macroblocks around said preferred reference macroblock based on pixels of said current macroblock and said second predetermined set of reference macroblocks for performing a fine tune operation; and

(a5 and b7) determining a motion estimation of said current frame and said reference frame from said determined similarities in step (b6) (Col 3 Lines 39-51, Col 10 Lines 42-52, Figs. 1 and 6).

As shown by the citations, Jeng teaches the use of the motion estimation for use with MPEG compression. MPEG compression inherently has the features of part (a) of claim 34. The remaining requirements (b)-(p) are equivalent to the requirements of claim 1 and therefore are rejected on the same grounds.

[claims 2, 3, 9 and 10]

Jeng teaches the use of sum of absolute differences (Abstract, Col 2 Lines 9-24).

[claims 21-26, and 36-38]

Jeng further teaches the use of the method for fields or frames, where the frames are made up of even and odd lines (Col 3 Lines 17-38, Figs. 7A and 7B). The citation

further shows the determining of a top field motion estimation and a bottom field motion

estimation.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 4, 5, and 13-16 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Kondo.

[claims 4, 5, 13 and 14]

As shown above for claims 3, 4, 9 and 10, Kondo teaches the use of SAD to

determine the best match. Kondo further teaches the use of other calculating means

such as sum of square differences (Col 2 Lines 43-51). It would have been obvious to

one of ordinary skill in the art at the time of the invention to use sum of square

differences in place of SAD in the motion estimation process as Kondo teaches such an

option is well known in the art (Col 2 Lines 43-51).

[claims 15 and 16]

As shown above for claims 11 and 12, Kondo teaches the use of absolute

difference of pixels between the current macroblock and a reference macroblock.

Kondo further teaches the use of other calculating means such as sum of square

differences (Col 2 Lines 43-51). It would have been obvious to one of ordinary skill in

the art at the time of the invention to use sum of square differences in place of SAD in

the motion estimation process as Kondo teaches such an option is well known in the art

(Col 2 Lines 43-51).

Claims 27-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Jeng.

[claims 27 and 33]

As shown in Figure 2, Jeng teaches the use of a motion estimation device

comprising a controller (12) , a first motion estimation processor (6, Fig. 1) and a

second motion estimation processor (8, Fig. 1) (Col 2 Line 61- Col 3 Line 4, Col 4 Lines

12-27). Jeng teaches the controller obtains the video from other on-chip encoding

circuitry, embedded imaging or video detection device integrated on-chip or equivalently

coupled discretely thereto as separate digital video signal detection or generation

appliance (Col 4 Lines 15-20). Jeng does not specifically teach the use of a frame

buffer. It is well known in the art to use memory (SDRAM or DRAM) in order to buffer

incoming images/video for processing (Official Notice). It would have been obvious to

one of ordinary skill in the art at the time of the invention to include a buffer in the

system of Jeng in order to store images for processing.

[claims 28-32]

As shown above for claim 8, Jeng teaches the method for the device of claims

27-32.

Claims 6,7, and 17-20 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Kondo as applied to claims 1 and 8 above, and further in view of US

Patent 6,442,203 to Demos.

[claims 6, 7, 17 and 20]

As shown above Kondo teaches the requirements of claims 1 and 8. Kondo

further teaches the use of SAD to determine motion vectors (Col 9 Lines 45-55). Kondo

is silent on the use of multiplication.

Demos teaches the use of SAD to determine motion vectors (Col 12 Lines 28-

42). Demos teaches an alternative to this method by using the AC correlation (Col 13

Lines 4-55). It would have been obvious to one of ordinary skill in the art at the time of

the invention to use the AC correlation method of Demos with the method of Kondo in

order to detect objects moving into the light, or out of the light, or in fading conditions as

taught by Demos (Col 13 Lines 4-15).

Claims 6,7, and 17-20 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Jeng as applied to claims 1 and 8 above, and further in view of US

Patent 6,442,203 to Demos.

[claims 6, 7, 17 and 20]

As shown above Jeng teaches the requirements of claims 1 and 8. Jeng further

teaches the use of SAD to determine motion vectors (Abstract). Jeng is silent on the

use of multiplication.

Demos teaches the use of SAD to determine motion vectors (Col 12 Lines 28-

42). Demos teaches an alternative to this method by using the AC correlation (Col 13

Lines 4-55). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the AC correlation method of Demos with the method of Jeng in order to detect objects moving into the light, or out of the light, or in fading conditions as taught by Demos (Col 13 Lines 4-15).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erick Rekstad whose telephone number is 571-272-7338. The examiner can normally be reached on 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on 571-272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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